Didactical tips and tricks

1 What to do before the practice sessions start?

Make arrangements with the didactical team (professor, other PhD students, monitor, ...):

- Which course(s)?
- Time schedule
- Will you guide these sessions alone or with other PhD students?
  If you and other PhD students guide the same session, good arrangements have to be made concerning the group division and which elements have to be seen in the sessions. All students should learn the same content.
- What are the goals of the course and the goals of the practice sessions?
- What is expected from you? What are your responsibilities?
- Are there tutorial services (“monitoraat”) for the course? If this is the case, you can refer students to the monitor for questions about elementary knowledge.
- What is the pre-knowledge of the students? How are they prepared?

Consultation of precursors:

- What material already exists?
- Which chapters are generally found difficult by the students?
- Can you observe there sessions? Do they want to observe yours?

A good preparation is crucial:

Content:

- Make sure you understand everything of the course.
- Try to define possible sticking points, considering the level of the students
- Do all the exercises yourself if possible. A rule of thumb is that students on average take 3x as much time as yourself.
- Follow the theoretical classes of the professor. This way you can make sure that the practice sessions connects to the theory. You also know which symbols, names, ... are used so you can be consistent. And you know exactly what the professor has said.
- Timing, planning: Is there time to review the theory? Which exercises have to be solved for sure by the end of the session? How much time do the students need for each exercise/experiment? How will you bring variety into the session?
- Select exercises if necessary.

Practical organisation:

- Room:
  - Is the room large enough for the number of students? If not, change the room reservation or divide the students into groups and reserve more rooms.
  - What hardware is present? Go to the room in advance to try out all the buttons, especially when you use your own laptop.
  - Computer sessions: is all the necessary software installed on the computers?
  - Lab sessions: prepare the experiments.

- Material:
  - Is all you need present in the room or do you have to bring stuff yourself (charcoal, ...)?
  - Break the charcoal in two to make less noise.
  - Write clearly on the blackboard. Try this out in advance if necessary and check if your handwriting is large enough to be read at the back of the room.
  - If you use Powerpoint slides or transparants, pay attention to the following elements: font size, font colour, animations, not too much text, ...
  - Do you make copies for the students yourself?
  - Stick to the essence of the course.

- Place in the time schedule
  Check whether the students have another class before or after your session. Make an agreement with the teachers of these classes to ensure that the transport time is not too disturbing. For example, everyone can stop a bit earlier or the location could be changed.
• Toledo:
  o Ask your professor in time to make you Teaching Assistant of the course to be able to edit
    the Toledo site.
  o Place documents online in time, especially when you expect the students to print them
    before the class. If you want them to print slides, make sure the slides are print friendly
    (handouts, no dark background, space to take notes, …)
  o A discussion forum could be a good idea to gather questions of students en to stimulate
    them to think about the course.
  o It can be useful to put exam information on Toledo.

• Name lists of the students:
  o Make sure you know who to expect in the practice session.
  o Students appreciate it when you address to them by name. It could stimulate them to
    participate more actively during the class.
  o At some departments you can get name lists with pictures of the students. This could help
    you to learn the names.

In general: The better you’re prepared, the more confident you seem to the students. However, try to have a
plan B in case some unexpected circumstances occur.
2 What to do during the first session?

The first impression is important!

- Introduce yourself.
- Give the students your contact information. Also place this on Toledo.
- Make clear practical arrangements about
  - Mobile phones
  - Being too late
  - Absence: is a medical attest necessary? Can the session be caught up with another group? Is it taken into account for the evaluation?
  - If the session is not obligatory, you could be clear: “Who doesn’t feel like working better stays at home.”
  - Division in groups: is it possible to change groups?
  - If many students are absent it may be better to merge groups together.
  - Students that follow the course for the second time tend to ask whether the practice sessions are the same as last year and whether they still have to attend to the sessions. Make clear arrangements in these cases with the didactical team and the students. You may also give them an alternative assignment or extra exercises.
  - A break during the session can help improve the motivation of the students. Let the students know whether there is a break and how long this break will be.
  - If the students are asked to prepare the session, let them know what you expect. Use their preparation during the session.
  - Where and when are solutions of exercises available?
- If you make arrangements, also point out what the sanctions are. Be consequent.
- Formulate the goals of the practice sessions.
- Clarify the use and goals of a session.
- What’s expected for the (practical) exam? What’s the form of the exam? Talk to the didactical team about this. For the expectations of the theoretical exam you can refer to the professor. Never say things you’re not certain about.
3 What to do during the rest of the sessions?

Motivating students

Motivation = the willingness of a student to engage himself for his education and the effort a student does to protect this engagement against any form of distraction.

Intrinsic: to like to do something by the character of the activity itself
Extrinsic: to do something because it leads to nice results

→ try to stimulate the intrinsic motivation as much as possible

Athmosphere:
- Make sure the room is well-arranged. This creates a nicer athmosphere for a class.
- Begin in time and end in time.
- Be clear and confident.
- Safe learning environment:
  - It is allowed to make mistakes. Comfort the students.
  - Admit your own mistakes. If you don’t know something, admit this and look it up by the next session.
  - Use wrong answers as a starting point
    - To start a discussion
    - To attach a correct answer
    - Clarify why the answer is wrong, give feedback, individually as well as globally.
- Don’t scare the students off with the way you answer questions.
- Try to be enthusiastic when you teach. This radiates to the students. Everyone can be made enthusiastic about anything!
- Pay attention to the use of your voice. Especially if you have to guide different sessions a day. Drink enough.
- Communicate with the students
  - Ask students that don’t cooperate what the problem is
  - Give feedback
  - Learn their names
  - Give them tips they wouldn’t get otherwise
  - ‘Exam’ is a magical word
  - Avoid to say things like ‘this is a very difficult course’
  - Give a compliment once in a while
  - Also pay attention to the non-verbal behaviour of the students
- Humour!
- Break/talking moment
- Noise is not necessarily a bad thing. De conversation could be about the exercises/experiment. Try to involve loud students. Ask them what the problem is: sometimes it’s an indication that the level is too low or too high. If necessary you can separate students en in the worst case scenario you can ask them to leave the room.
- When there is a lot of fuss it can help to stop teaching to restrain order. Cooperative students will point out to loud students that they disturb the class.
- If students don’t answer your questions or aren’t cooperative: find out why this is the case: lack of knowledge or lack of motivation? Address to the students individually.
- If one student disturbs the class you can make a comment (for example ask to share their problem with the group), ask the student to sit somewhere else or eventually even to leave the room.
- Point out to disturbing students that the content/skills are important for the exam.
- Vary in your teaching methods.
- If students are uncomfortable at the beginning of the session you can use an icebreaker, for example an anecdote, ask about a party, ask what they’ve seen in theory class, ...

Challenge: adapt to the level of the students
- Adapt the rate to the student level. To keep everyone motivated the material has to be complex enough.
- Check whether students understand your explanation or the assignment.
  - Divide the problem into partial problems.
- Solving an example exercise together can help.
• Work with basis and extension exercises.
  o If good students ask for an extra challenge, don’t just offer more of the same, this is
demotivating. It should stay worth for the student to try and work as hard and accurate as
possible.
  o Address the evaluation to this. For example students can earn extra marks if they can also
solve the more complex exercises.
• Make groups of students with a different background and make them explain things to each other.
• Choose examples that are connected to the reality and to the world of the students:
  o Students want to know what the usefulness is of a course / of exercises
  o You could use old exam questions as an example (agree with professor)
• ‘Dose’ the contribution of good students
• Realise and accept that you probably won’t reach everyone.

Activating students

Silent activation
= keep the students active without expecting a contribution
= keep their attention

• Variation: lecture, demonstration, exercises, video material, anekdotes, humour, ...
• Avoid redundant repetition of the theory
• Build in a competitive aspect so that students work independently. Motivate the students by
challenging them.
• Use aids to allow the students to think actively, for example copies of transparants, fill in pages,
didactical material, ...
• Find a balance between what you say yourself and what the students say.

Interactive teaching
• Interaction with an individual:
  o Pose straightforward questions
  o Designate students to answer. This is easier if you know their names.
  o If necessary, subdivide questions into sub questions and give a hint if they’re too difficult.
  o If a question is too simple you most likely won’t get an answer either. Pay attention to the
level of the exercises and the students.
• Answer a question with a question: “What do you think yourself?”, “What is your answer based on?”
  o You can reason together.
  o Students will be motivated to be responsible for their own learning process.
• Tell students where to fin dan answer instead of giving them the answer directly.
• Give the solution only if the students found it themselves. Although sometimes it may be useful to
give them all the solutions at the end of the session, so that students can check their solutions later
on.
• Think actively and allow students to join you, don’t just use model answers. Build off the guidance
during the session.
• Respond to questions by posing them to another student, for example “Do you think the same?”. This is a good way to start a discussion.
• Repeat a question for the whole group or solve problems classically if necessary.
• Try to involve all students, including the silent ones:
  o Divide your attention.
  o Give the students enough time to think. Have no fear of silence.
  o Let the students discuss amongst theirselves before giving an answer. This builds up their
confidence.
  o If students cooperate, let them speak.
• Group work:
  o Students learn a lot from each other.
  o You could agree that questions are only asked if no-one within the group knows the answer.
  o By realising they all have similar problems their confidence rises.
  o A good follow-up is necessary.
• Ask students to bring the answer on the blackboard. Make sure not always the same students do
this.
• Walk in between the students, be approachable.
• Also answer theoretical questions and try to view problems from different angles.
• Divide your attention to all students. If there are too many students consider asking a second teaching assistant.
• Don’t be satisfied with the (numerical) answer. Ask about why and how, focus on the solution strategy.
• Let students answer multiple choice questions by raising their hands. This way they have to think actively but aren’t addressed personally.
• Try to avoid redundant questions.
• Refer to the possibility to ask questions after the session.
• If there are no questions you can ask questions yourself to find out why there are no questions: do the students understand everything of don’t they understand anything?
• Discussion forum on Toledo: follow-up is important.
• Guided Independent Learning http://wet.kuleuven.be/BZ (Dutch)
• Use an example exam to test the students. Quote this as if it were a real exam.
• Ask the students to make a synthesis of the main issues of the session. You can also ask them to present their preparation, their results, … This forces them to be active.
• Let students come up with their own examples, applications, illustrations, …
• If some students finish early with their exercises you can use the extra time to discuss the solutions.
• Faster students can be used to explain things to the slower students.
• Extra information can be placed on Toledo to challenge stronger students.
• If students wait until the solutions are given you can first start the next exercise so that they feel the pressure to work.

Let students prepare the practice session
• Advantages:
  - Students know what the session is about.
  - They can ask concrete questions about things they don’t understand.
• Disadvantage:
  - It’s time intensive.
• Remarks:
  - Be clear about what has to be prepared and why.
  - Let the professor point this out during theory class.
  - Make sure the preparation is relevant and students understand the usefulness.
  - Do something with the preparation. If students notice the preparation was useless they won’t prepare the next session.
  - You can take the preparation into account for the evaluation, or you can ask students to write down some general concepts on the blackboard.
  - If students aren’t prepared you can give them one chance by repeating the theory or letting a prepared student do this. It has to be very clear that this happens only ones, during the next session unprepared students will be waisting their time. Students are responsible for their own learning process.
  - If necessary you can “sacrifice” one session so that students feel the obligation to prepare themselves. Be consequent on what you agree.

More
• Stay within your time.
• Formulate the goals and usefulness of each practice session.
• If you give exercises in advance, do this in time.
• If there is not enough time to do all the exercises that the professor gives you, you can subdivide them into types of exercises and do 1 of each type. You can give the rest to take at home.
• Don’t be intimidated by students that disturb the class or are non-cooperative.
• If you use transparencies:
  - Don’t go too fast
  - Don’t use light colours
  - Bring copies for the students
  - There exist special pens that are whipeable on transparencies. This way you don’t need the blackboard as well.
• In a big room you can ask the last rows to move to the front. If your intention is to walk around, ask them to leave rows open so that you can pass.
• Be open for questions or reactions. If there are too many questions refer to the possibility to ask them after class, to go to a monitor or a forum.
• Treat male and female students equally. Research has shown teachers tend to spend more attention to male students.
• Refer to next sessions during an explanation.
• If a report is asked be clear about page limits, structure, form, … so that students don’t waste time with this. Writing a report preferably happens at home.

4 What to do after a session?

Evaluate yourself:
• Questionnaire

Let the students evaluate you:
• Questionnaire

Quoting an exam:
• Use well-defined criteria.
• Discuss with the didactical team.
• It’s best to quote an exam by question so that each question is quoted by the same person.
• Sometimes it is more objective to quote in two steps: first look at all the answers then define marks.
• At the end a number of reports can be compared as a check.
• Avoid ambiguous questions.
• Group reports: define in advance how differences within a group are dealt with (peer evaluation, bonus points, …)

Look at the results
• Are the results what you expected from the students?
• Are they related to the results of the theory exam?

More
• Give feedback to the didactical team about the practice sessions.
• Make clear to the students when they can reach you with questions, especially during the exam period.
• Clean up the classroom after the session.